

REMARKS

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

Claims 11 and 16-18 have been withdrawn from prosecution in the present application. It is noted that these claims are directed toward a non-elected species and will be considered upon allowance of a generic claim (i.e., claim 1).

With regard to the specification, the Examiner has indicated that the meaning of a portion of paragraph [0062] is unclear. This portion of the specification describes how the section modulus of the backing plate, both with and without apertures, is related to the section modulus of the blank sheet, and describes how the number and size of the apertures in the backing plate could be determined so as to have the characteristics (section modulus) of the backing plate meet the characteristics (section modulus) of the blank sheet. Although this portion of the specification, when read in context and in light of the remainder of the specification, is considered to be clear to one skilled in the art, the paragraph has been amended in the foregoing. The Examiner's approval of this amendment is requested. It is respectfully submitted that no new matter has been added to the specification by the present amendment. Reconsideration and withdrawal of the objection to the specification is requested.

The Examiner has objected to claim 9 under 35 U.S.C. §112, first paragraph, as containing subject matter that was not described in the specification. The Examiner's objection is respectfully traversed.

It is submitted that the subject matter of claim 9, namely that the "aperture is designed so as to make a section modulus of the backing plate equal to a section modulus of the blank material". In the originally filed application, it is clearly stated that number and size of the apertures in the backing plate are determined and machined so as to have the backing plate meet the characteristics of the blank sheet. The characteristic being referred to is the section modulus. Although it is acknowledged that there is not word-for-word correspondence between the language of claim 9 and the disclosure in the specification - such correspondence is not required. Rather, it is only required that the disclosure in the specification convey the claimed invention to one skilled in the art. Based upon the foregoing, it is respectfully submitted that one skilled in the art would recognize that the claimed subject matter was in the inventor's possession at the time the present application was filed.

With regard to the Examiner's comments provided on page 4 of the Office action (which are directed toward page 11 of the Substitute Specification), it is believed that the Examiner has misinterpreted the disclosure. The following is provided to assist the Examiner.

The portion of page 11 of the Substitute Specification (which was subsequently amended in Amendment "B" filed on July 15, 2003), refers to **FIG. 6**, and indicates that the section modulus (Z_1) for the blank sheet 18 is defined as:

$$Z_1 = (b_1) \cdot (h_1)^2 / 6 ; \text{ wherein } b_1 \text{ is the width of the blank sheet 18 and} \\ h_1 \text{ is the height of the blank sheet.}$$

Similarly, the section modulus (Z_2) for the backing plate 13 is defined as:

$$Z_2 = (b_2 - n \cdot d) \cdot (h_2)^2 / 6 ; \text{ wherein } b_2 \text{ is the width of the backing plate 13,} \\ d \text{ is the diameter of the aperture 17, } n \text{ is the number of the}$$

apertures, h_2 = the thickness of the backing plate.

Hereafter an example will be provided using these basic formulas under the assumption that the section modulus of the blank sheet is equal to that of the backing plate (i.e., $Z_1 = Z_2$).

Assuming that the widths (b_1 , b_2) of the blank sheet and the backing plate are equal to 100 mm and that the height (h_1) of the blank sheet is 4 mm, and that there are 7 apertures ($n=7$) each having a diameter of 5 mm ($d = 5$), the first equation solves as:

$$Z_1 = 100(4)^2/6 = 266.67$$

$$\text{Therefore, } Z_2 = 266.67 = (100-7(5)) (h_2)^2/6 = 10.83 (h_2)^2$$

$$266.67/10.83 = (h_2)^2 \rightarrow h_2 = 4.96 \text{ mm}$$

Thus, based upon this example using the formulas provided in the specification, it is shown that adjusting the section modulus of the backing plate relative to that of the blank sheet is a simple matter. Further, assuming that the physical dimensions (i.e., height and width) of the backing plate and blank sheet are known, it is a simple mathematical operation to solve the equation to determine the number and size of the apertures that will result in the section modulus of the backing plate meeting the characteristics of the blank sheet.

In light of the foregoing, the Examiner is asked to reconsider and withdraw the rejections of the specification and claims based upon §112.

Claims 1-3, 10, and 12-15 stand rejected as being unpatentable over Applicant's Admitted Prior Art (AAPA), represented by Figs. 19A-19B of the present application, in light of British Patent 2197810. Claims 1-3, 10, and 12-15 also stand rejected as being unpatentable over AAPA in light of Japanese Patent 59-202119.

The '810 patent teaches the desirability of forming grooves in a metal blank at

locations corresponding to a fold line. The grooves ease bending of the blank along the fold lines. The '810 patent also indicates, in the background section, of the undesirable practice of forming holes along the fold line of the metal blank to facilitate bending thereof.

Based upon the drawings, the '119 patent teaches forming a hole 3 at a bend line 2 of a part 1.

The Examiner has determined that it would have been obvious to one skilled in the art to combine the AAPA and the teachings of the '810 patent to arrive at the claimed invention. The Examiner has also determined that it would have been obvious to one skilled in the art to combine the teachings of the AAPA with those of the '119 patent to arrive at the claimed invention. The Examiner's rejections are traversed for the following reasons.

Initially, it is noted that the applicant does not contest the applicability of the AAPA against the presently claimed invention. Clearly, this information has been admitted as being known in the art, and has been provided by the applicant as part of applicant's duty of disclosure.

However, it is important to note that the AAPA merely shows that it is known to form a backing plate to have bends or fold lines that correspond to bends or fold lines that are formed in the host blank sheet, and to attach the backing plate to the blank sheet. The AAPA teaches nothing further.

The present invention is directed toward solving the problems in the AAPA wherein a backing plate of sufficient rigidity (to serve as a stiffener of structural support for the blank sheet) would have problems associated with bounce-back following forming. With such problems, it has been required to form or bend the backing plate separately from the blank sheet, which increases the manufacturing

time and cost. Even with this extra step and associated costs, the shape of the formed backing plate will still not match blank sheet, especially at the bend lines. Due to the presence of gaps or spaces between the blank sheet and the backing plate, the AAPA exhibits a decreased reinforcement strength.

The present invention is directed toward reducing or eliminating these disadvantages, and is based upon the discovery that forming holes in the otherwise "stiff" backing plate creates a localized or focused weakness or reduction in the section modulus of the backing plate such that the characteristics of the backing plate can be tuned to that of the blank sheet. This has permitted the backing plate and blank sheet to be formed in a common bending operation, and has enhanced the face-to-face contact between the backing plate and the blank sheet, especially at the bend lines, and thereby has reduced or eliminated the reinforcement problems experienced in the prior art.

Turning to the Examiner's rejections, it is noted that while the problems encountered by the prior art and the present invention are not relevant when addressing a novelty rejection under Section 102, they are highly relevant when assessing a rejection based on obviousness.

The '810 patent teaches the desirability of forming grooves along the bend line of a part to facilitate forming (bending) thereof. The '119 patent teaches forming a hole at a bend line. Neither the '810 patent nor the '119 patent is concerned with the problems encountered and solved by the present invention - how to form two parts in a single forming operation wherein the parts have different physical characteristics (section modulus) that renders such forming impossible. Rather, the '810 and '119 patents are directed toward solving problems that are not relevant to the present invention - how to manually bend a metal part. In this regard it is noted

that present invention uses an automated hydraulic press (whereby bending is not an issue) while the cited patents presumably employ a hand-bending operation.

Therefore, it is respectfully submitted that one skilled in the art, when trying to improve upon the state of the art (as embodied in the AAPA) would not look to the teachings of the '810 and '119 patents as they are directed toward solving problems that are totally unrelated to those encountered in the AAPA. For at least these reasons, it is submitted that the Examiner has failed to establish a prima facie case of obviousness.

Further, and as noted in the Remarks accompanying the prior Amendment, it is again pointed out that even if the references were combined as advocated by the Examiner, the invention as defined in claim 1 would not result. Specifically, none of the cited art teaches a backing plate "having at least one aperture formed therein at the bent portion thereof and located on the bending line". Despite the Examiner's assertions to the contrary, the cited art is directed toward forming of a "blank" - not toward forming of a "backing plate". Therefore, even if the AAPA were combined with the '810 and/or '119 patents, the resulting combination would necessarily be a solid backing plate secured to a blank sheet, wherein the blank sheet would have an aperture (or grooves) formed along its bend line. Since none of the cited art teaches a backing plate having apertures along the bend line thereof, and since the aperture in the prior art is provided to solve a problem that is not encountered in the AAPA or the present invention, there is no reason, apart from the present application, to combine the references in the manner that would result in an apertured backing plate being secured to a solid blank sheet. Therefore, it is respectfully submitted that the present invention is patentable over the cited art.

Claims 19-29 have been added to the present application. New claim 19 is

similar to claim 1, but includes the further feature that the "the backing plate bent portion and the blank material bent portion are in intimate contact with one another". Support for this language can be found in the originally filed specification at, for example, page 6, paragraph 2. It is respectfully submitted that none of the cited references, including the AAPA, teaches this feature of present invention. It is noted that the AAPA expressly teaches away from this feature of the invention. Favorable consideration of claim 19, and claims 20-27 that depend therefrom, is requested.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. Claims 1-3, 9-10, and 12-15 are patentable over the art of record. Upon allowance of claim 1, it is applicants understanding that withdrawn claims 11 and 16-18 will be considered.

If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. SHM-12585.

Respectfully submitted,

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